

We claim:

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A thermoplastic film comprising:

- a. a core layer comprising about 60 wt% to about 95 wt% of a polylactic acid having a D-lactic acid level from about 1 mol% to about 8 mol%, and about 5 wt% to about 40 wt% of a toughening additive, wherein the core layer comprises the interior of the film.
- 2. The thermoplastic film of claim 1 further comprising:
 - b. a first skin layer comprising a polylactic acid having a D-lactic acid level of at least about 8 mol%, wherein the first skin layer is exterior to the core layer.
- 3. The thermoplastic film of claim 2 further comprising:
 - c. a second skin layer comprising a polylactic acid having a D-lactic acid level of at least about 8 mol%, wherein the second skin layer is exterior to the core layer, and on a side of the core layer opposite the first skin layer.
- 4. The thermoplastic film of claim 2 wherein the first skin layer further comprises a slip additive.
- 5. The thermoplastic film of claim 2 wherein the first skin layer from about 1 wt% to about 10 vt% of a poly(epsilon-caprolactone).
- 6. The thermoplastic film of claim 1 wherein the toughening additive is selected from the group consisting of poly(epsilon-caprolactone), metallocene plastomers, styrene-ethylene-butene-styrene (SEBS) block copolymers, polyethylene succinate, polybutylene succinate/adipate, polybutylene succinate/carbonate, polyethylene, polyurethane, and mixtures thereof.
- 7. The thermoplastic film of claim 1 wherein the core layer is cavitated.
 - 8. The thermoplastic film of claim 7 further comprising an inorganic cavitating agent selected from the group consisting of solid glass spheres, hollow glass spheres, metal beads, metal spheres, ceramic spheres, calcium carbonate, and mixtures thereof.
- 9. The thermoplastic film of claim 7 wherein the cavitating agent comprises calcium carbonate, and wherein the core layer further comprises high density polyethylene.

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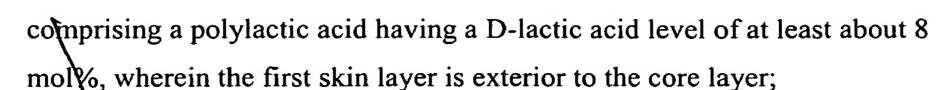
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- 10. The thermoplastic film of claim 1 wherein the film has a thickness from about 1 mil to about 5 mils.
- 11. The thermoplastic film of claim 1 wherein the film has a thickness from about 1 mil to about 10 mils.
- 12. The thermoplastic film of claim 1 wherein the film is biaxially oriented.
 - 13. A thermoplastic sleeve label adapted to be applied to a container comprising:
 - a. a core layer comprising about 60 wt% to about 95 wt% of a polylactic acid having a D-lactic acid level from about 1 mol% to about 8 mol%, and about 5 wt% to about 40 wt% of a toughening additive, wherein the core layer comprises the interior of the label; and
 - b. a first skin layer comprising a polylactic acid having a D-lactic acid level of at least about 8 mol%, wherein the first skin layer is exterior to the core layer.
 - 14. A container having a thermoplastic sleeve label comprising:
 - a. a surface of the container;
 - b. an adhesive adjacent to the surface;
 - c. a label comprising a core layer comprising about 60 wt% to about 95 wt% of a polylactic acid having a D-lactic acid level from about 1 mol% to about 8 mol%, and about 5 wt% to about 40 wt% of a toughening additive, wherein the core layer comprises the interior of the label; and a first skin layer comprising a polylactic acid having a D-lactic acid level of at least about 8 mol%, wherein the first skin layer is exterior to the core layer.
 - 15. The container of claim 14 wherein the label further comprises a second skin layer comprising a polylactic acid having a D-lactic acid level of at least about 8 mol%, wherein the second skin layer is exterior to the core layer, and on a side of the core layer opposite the first skin layer.
 - 16. A process for producing a thermoplastic sleeve label comprising the steps of:
- a. coextruding a core layer comprising about 60 wt% to about 95 wt% of a polylactic acid having a D-lactic acid level from about 1 mol% to about 8 mol%, and about 5 wt% to about 40 wt% of a toughening additive, wherein the core layer comprises an interior of the film; and a first skin layer

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- b. orienting said label in the machine direction;
- c. heat annealing said label; and
- d. treating said label with at least one of plasma, corona, and flame treatment.
- 17. The process of claim 16, further comprising coextruding the core layer, wherein the core layer further comprises a second skin layer comprising a polyactic acid having a D-lactic acid level of at least about 8 mol%, wherein the second skin layer is exterior to the core layer, and on a side of the core layer opposite the first skin layer.
- 18. The process of claim 17, further comprising the step of printing said label on at least one of the first skin layer and the second skin layer.
- 19. The process of claim 16, further comprising the step of printing said label on the first skin layer.
- 20. The process of claim 16, further comprising the step of forming said label into a tube and sealing said label with a seal selected from the group consisting of solvent seal, heat seal, ultrasonic seal, and adhesive seal.
 - 21. The process of claim 16 further comprising the step of orienting said label in the transverse direction.
- 20 22. The process of claim 16 further comprising the steps of:
 - a. placing said tube onto a container; and
 - b. shrinking said tube with the application of at least one of heat and UV light.